NETTS PROJECT/DEMONSTRATION SUMMARY

NCBC-57-01

Title: Multi-Level Sampling Transect

Lead PI/Affiliation: GeoSyntec
Co-PI's/Affiliations: EPA NRMRL
U Waterloo

Date/Duration:
Initiated - 09/00
Completed - 09/01

Abstract:
Many DoD facilities have contaminated groundwater due to accidental release of fuel products and chlorinated solvents. Many investigations have shown that contaminant plumes are typically complex zones, which exhibit large variations in concentration over small vertical and horizontal distances. Spatial and temporal variability of the contaminant sources and heterogeneity of the hydraulic conductivity field cause these variations. Conventional monitoring wells are often ineffective for discerning the details of the concentration distribution in plumes and particularly for locating the highest concentration zones because the well screens provide water samples that are a mixture of waters of different composition from various depths. A new multi-level monitoring system has been developed that uses custom-extruded flexible multi-chamber polyethylene tubing to monitor as many as seven discrete zones within a single borehole. A consortium of private industry (GeoSyntec Consultants, Solinst, and ResonantSonic International) and US EPA National Risk Management Research Laboratory Ada combined resources and services to install a well transect consisting of 47 multi-level monitoring wells spaced at 10 feet intervals, across the width of the NEX plume. The transect of wells will be sampled over several quarters to obtain possible variations in chemicals of concern (gasoline components and MTBE) and geochemicals.

Construction of the intake ports and screens is done before the multi-chamber tubing is inserted into the borehole. Intake sampling ports are drilled through each of the chamber's exterior walls at the desired depths, with the central chamber open to the bottom of the multi-level well. Each chamber is hydraulically connected to only one monitoring interval (8, 10, 12, 14, 16, 18, and 20FT below ground surface (bgs)). The boreholes are drilled using a sonic drill rig. A steel drive casing is advanced into the borehole, the fabricated multi-chamber tubing is inserted through the casing, and the casing is then removed allowing the soil to collapse onto the well.

This effort will:

1. Determine the "architecture" of the plume of the geologic media within which it is travelling
2. Estimate (over time) the mass discharge (preferred flux paths and flux integrated over total cross sectional area) of MTBE and other geochemical species.
3. Show that such a transect can be installed relatively easily and inexpensively.
4. Provide data that will be useful for planning and operating remediation projects.

Results/Conclusions: Ongoing project

Publications: None